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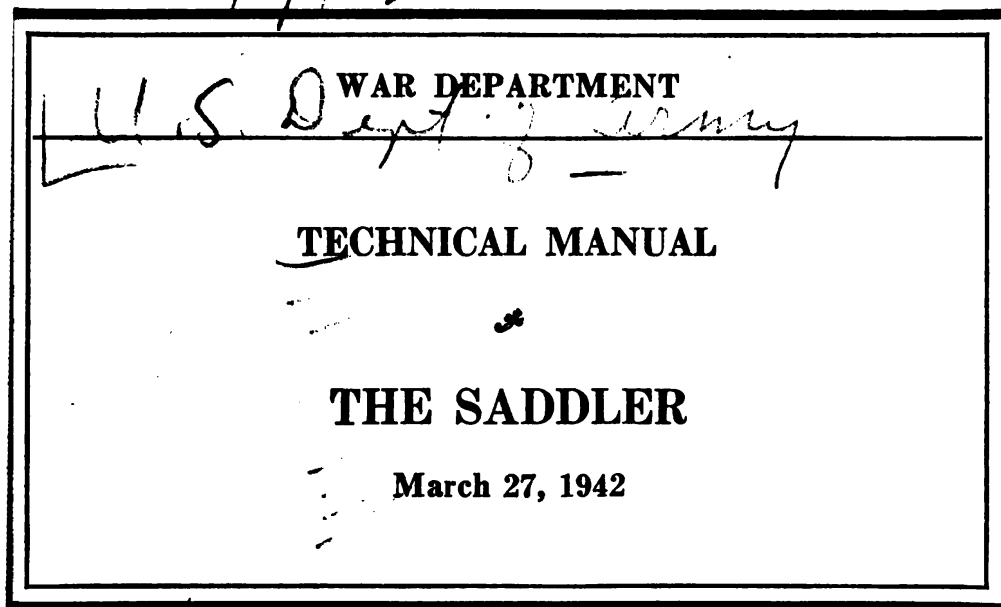
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TECHNICAL MANUAL }
No. 10-430 }



WAR DEPARTMENT,
WASHINGTON, March 27, 1942.

THE SADDLER

	Paragraph
Duties.....	1
Tools.....	2
Allowance of material.....	3
Cutting leather.....	4
Working leather into shape.....	5
Finishing edges.....	6
Using saddlers' wax.....	7
Making waxed end.....	8
Sewing with waxed end.....	9
Using double needle.....	10
Preventing sore fingers.....	11
Repairing breaks.....	12
Repairing with rivets.....	13
Modifying McClellan saddles.....	14

1. Duties.—*a.* The saddler is charged with the repairs of all harness, horse, and other leather equipment issued to his organization. He must be skilled in the use of the tools which comprise the saddlers' set.

b. He should make repairs as damages occur and not allow broken parts to accumulate. By preparing in advance a limited supply, based upon experience, of extra parts such as straps, cheek pieces, throat straps, etc., he will facilitate the repairing and save himself the annoyance of many rush jobs, especially with old harness.

c. He will be provided with the necessary tools, leather, etc., to make repairs when on the march or at halts.

2. Tools.—*a. Set.*—The saddlers' set is authorized for issue, in general, to all companies, batteries, and troops having saddlers or to which animals are assigned; and to certain regiments and separate battalions. The actual basis of issue is as provided in Tables of Basic Allowances of the various arms and services. The set is composed of the chest and tools shown in figures 1 to 11, inclusive. (See also table I.)

b. Kit.—(1) For those organizations entitled to a saddlers' set, the saddlers' kit, for use by the saddler on the march, will be taken from the set and will normally consist of the articles listed in table II.

*This manual supersedes Training Manual 2100-25, July 21, 1930.

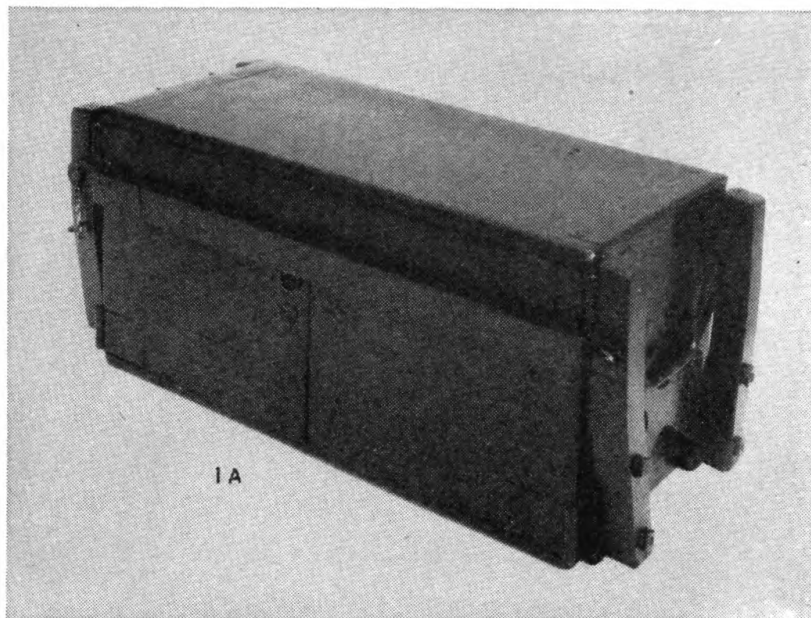
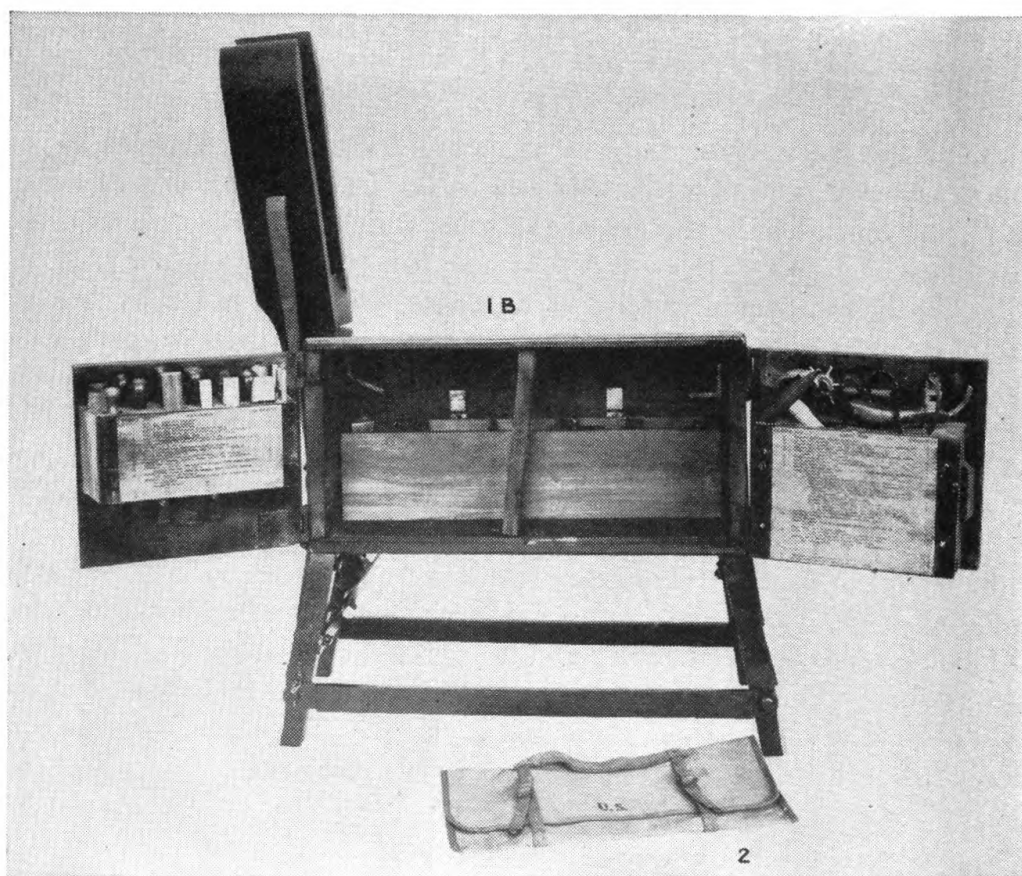


FIGURE 1.—Set, saddlers'—tool chest closed, ready to ship.



1B. Tool chest open with clamp on ready to use.

2. Tool kit, canvas. shown on side.

FIGURE 2.

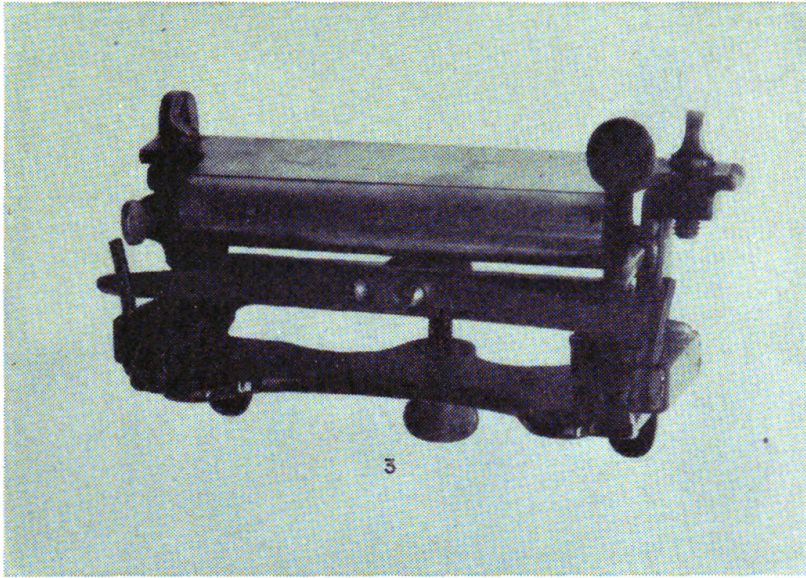


FIGURE 3.—Machine, saddlers', splitting, 8-inch, for splitting leather to desired thickness.

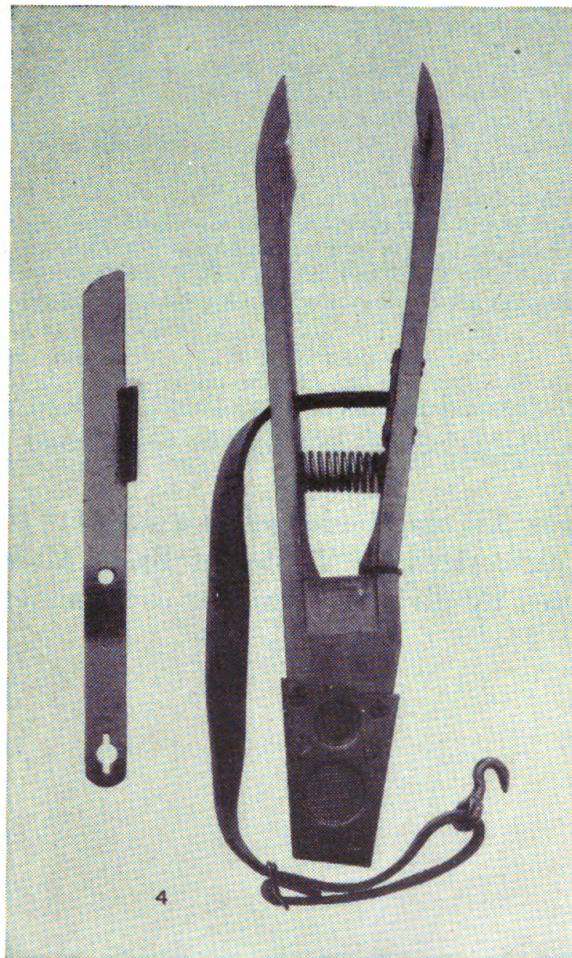
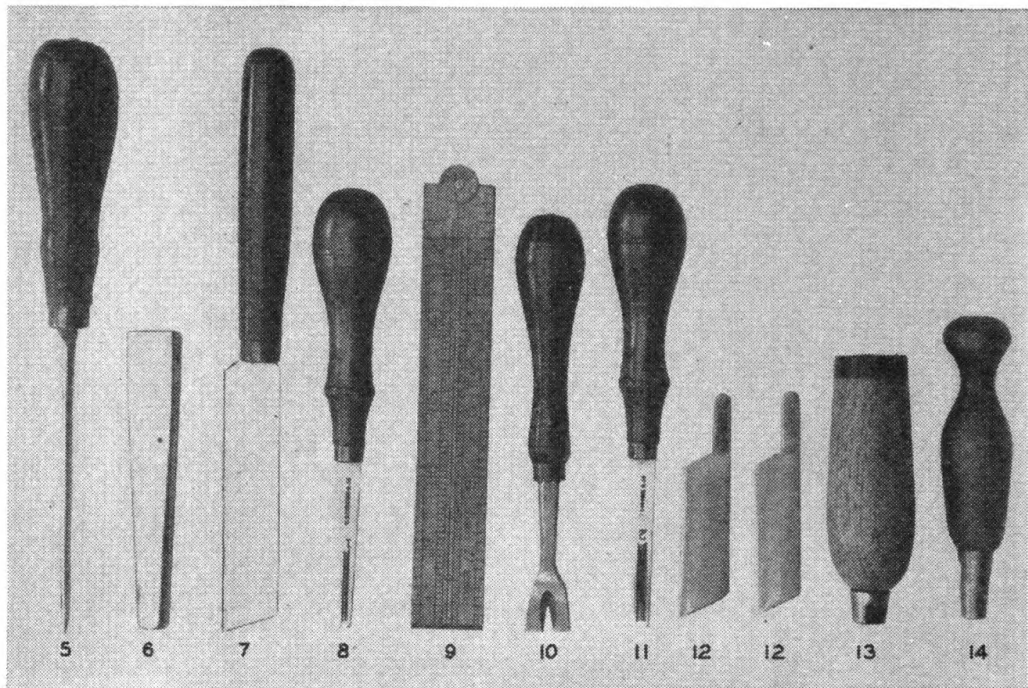


FIGURE 4.—Clamp, saddlers', stitching, with foot lever, attached to chest in bracket provided for that purpose, forming stitching horse for holding leather parts while being stitched.

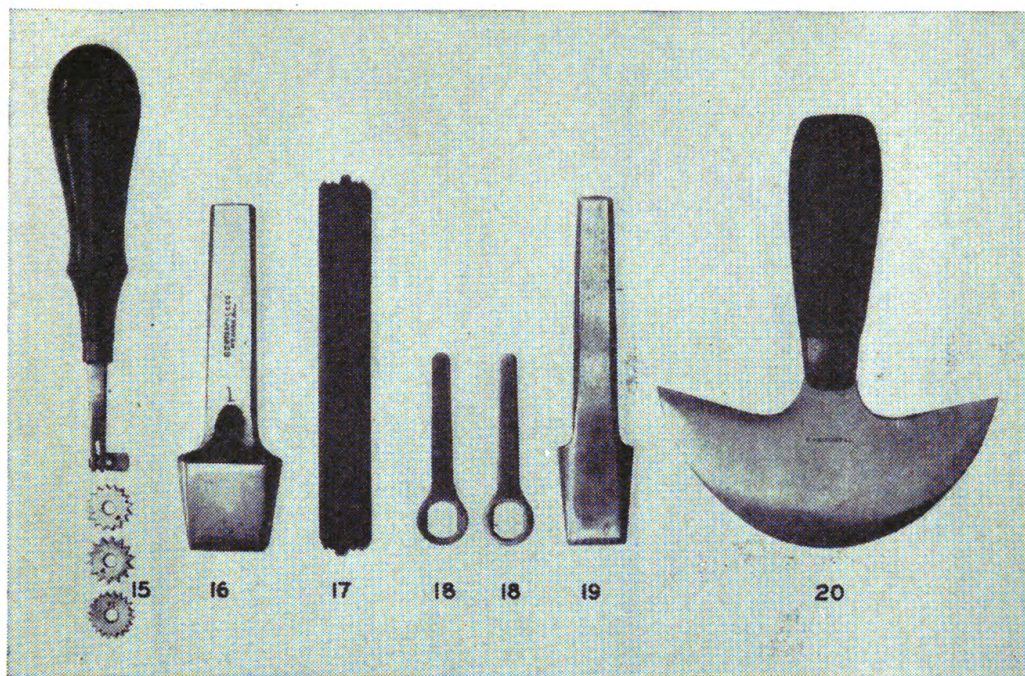


5. Awl, saddlers', shouldered, to make holes through which to pass stitching.
6. Set, rivet, oval, for setting rivets.
7. Knife, saddlers', square point, for cutting stitches.
8. Tool, saddlers', round-edger, No. 1, for trimming sharp edges of straps or other leather parts.
9. Rule, carpenters'.
10. Tool, saddlers', for pulling tacks, nails, etc.
11. Tool, saddlers', round-edger, No. 2, for trimming sharp edges of straps or other leather parts.
12. Blades, saddlers', draw-gage, fastened in draw gage by set screw, to cut leather to desired width.
13. Haft, awl, saddlers', pegging, for handle in which awl blade is fitted and then tightened in place.
14. Haft, awl, saddlers', stitching, for handle in which awl blade is fitted and tightened with wrench.

FIGURE 5.

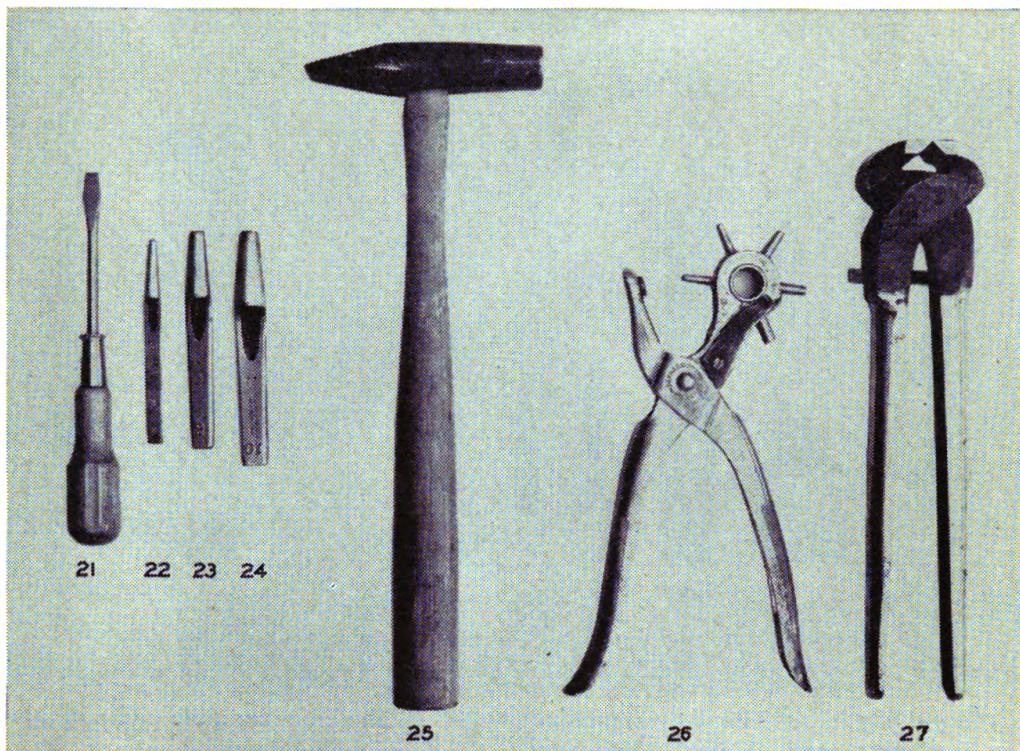
These articles are carried in the canvas tool kit (item 2, fig. 2). However, the exact contents of this kit may be prescribed by the organization commander.

(2) The saddlers' kit may be issued as a separate item of supply to certain units if authorized by Tables of Basic Allowances or when specifically directed by division or higher commanders.



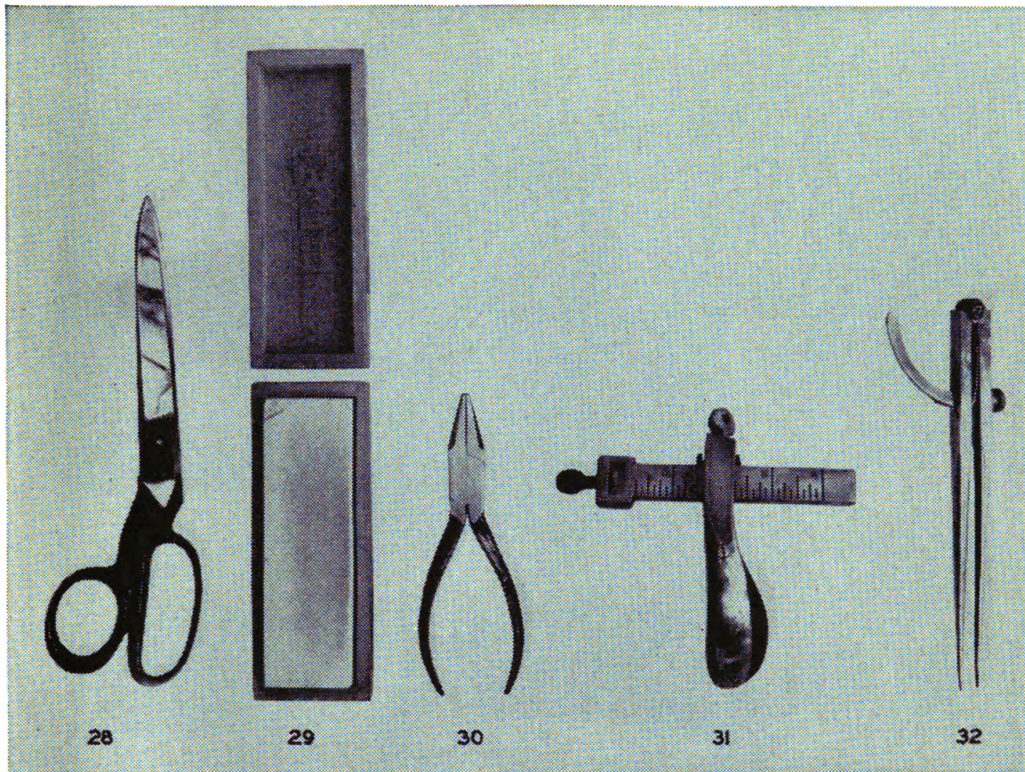
15. Carriage, saddlers', pricking, with three pricking wheels, held in carriage and used for marking places for stitches so as to make them uniform.
16. Punch, bag, saddlers', 1-inch, to cut holes for buckles, slots, etc.
17. Creaser, saddlers', double ebony or lignum-vitae, for making creases along edges of straps.
18. Wrenches, haft, awl, saddlers', pegging and stitching, for tightening awl haft.
19. Punch, bag, saddlers', $\frac{3}{4}$ -inch, to cut holes for buckles, etc.
20. Knife, saddlers', round point, for cutting out leather parts of all shapes; cutting off straps; skiving ends; etc.

FIGURE 6.



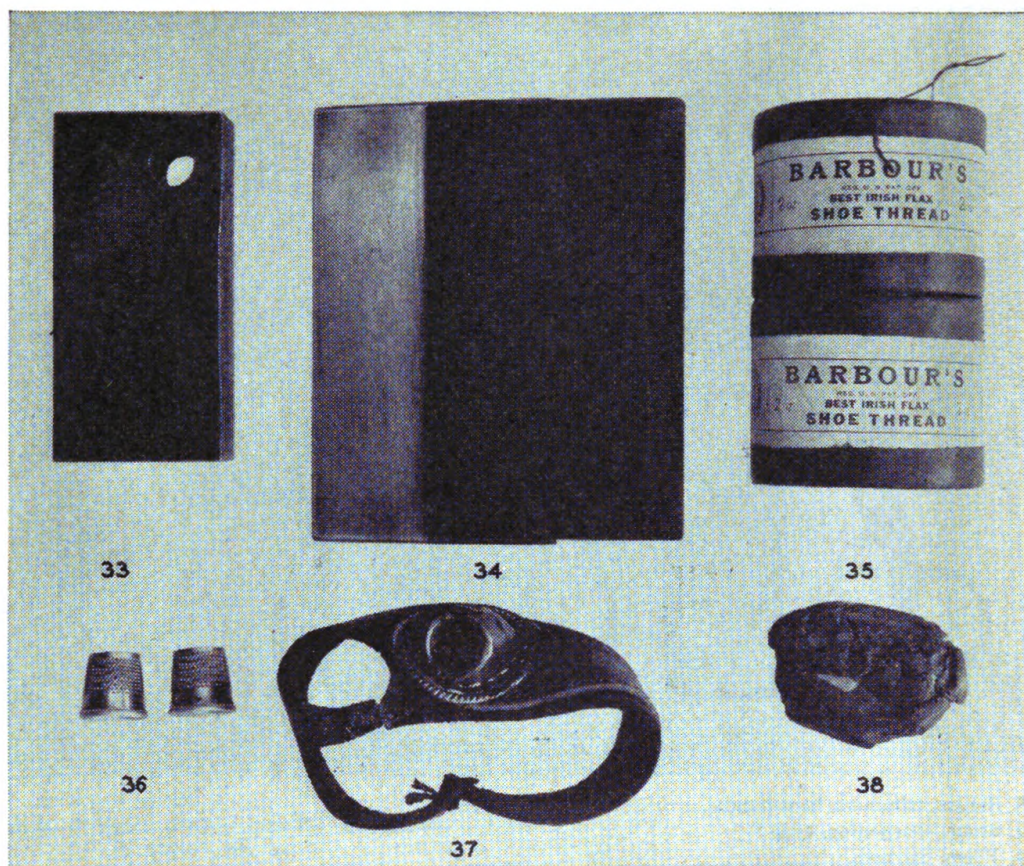
- 21. Screw driver.
- 22-24. Punches, cutting, type III, leather, canvas, etc.:
 - 22. $\frac{1}{8}$ -inch, No. 2.
 - 23. $\frac{1}{4}$ -inch, No. 10.
 - 24. $\frac{5}{16}$ -inch, No. 13.
- 25. Hammer, riveting.
- 26. Punch, revolving, six tubes, Nos. 1-6, for punching holes of different sizes through straps, etc.
- 27. Nippers, end-cutting, with adjusting screw in handle, for cutting off rivets only.

FIGURE 7.



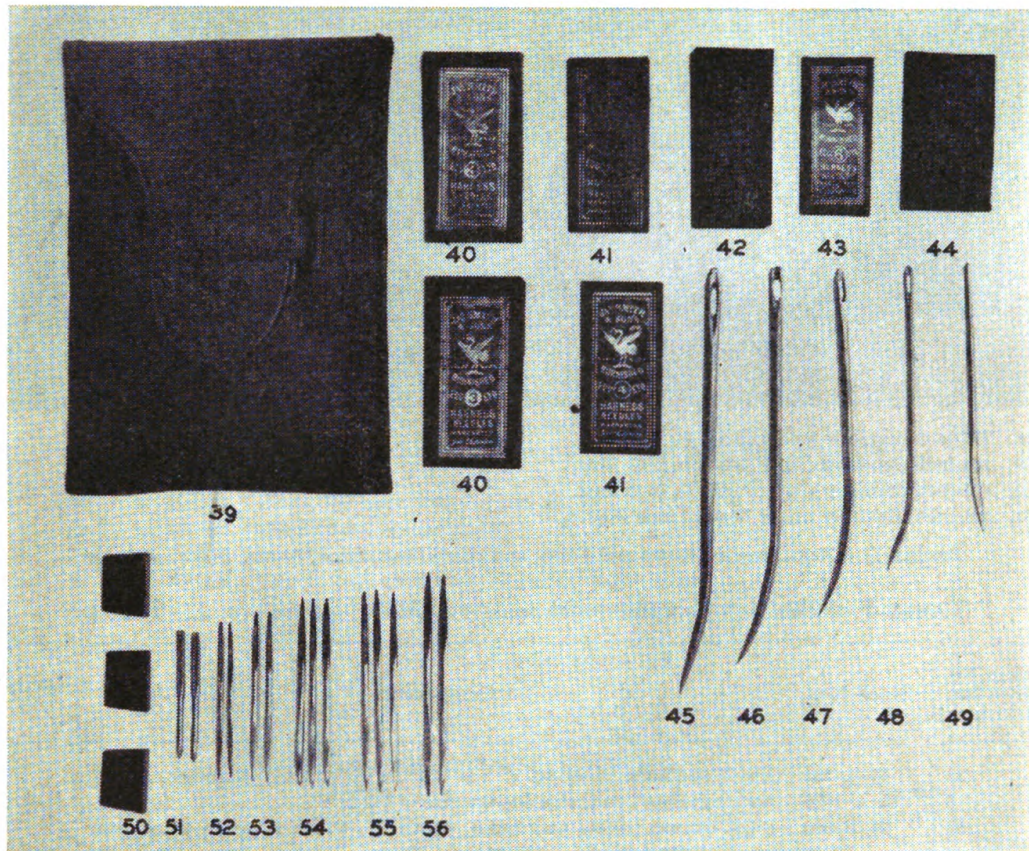
28. Shears, trimmers, bent-handle.
29. Stone, sharpening, type I.
30. Pliers, flat-nose.
31. Gage, draw, saddlers', with trigger handle, for cutting straps into desired widths.
32. Divider, wing, type C, for describing circles, marking distances for punching holes in straps, etc.

FIGURE 8.



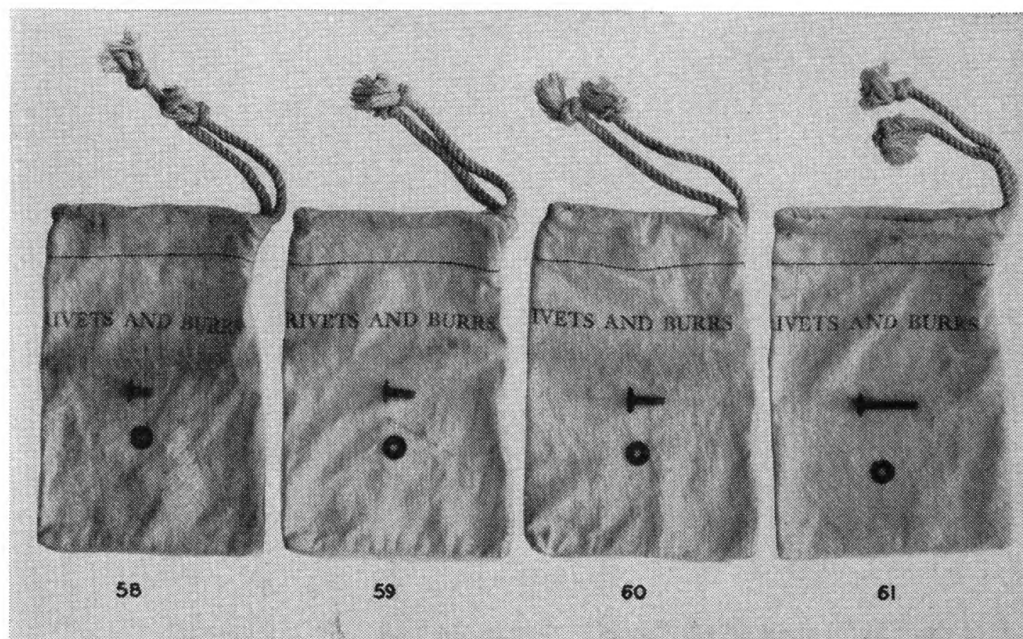
- 33. Anvil, saddlers', riveting.
- 34. Slicker, saddlers', steel, for smoothing and rubbing leather to prevent further stretch.
- 35. Thread, linen, type C.
- 36. Thimbles.
- 37. Palm, sewing, for forcing needle in sewing canvas.
- 38. Wax.

FIGURE 9.



39. Needle case.
 40-49. Needles.
 50. Followers, saddlers', draw-gage, $\frac{5}{8}$ -inch.
 51-56. Blades, awl, saddlers', pegging.

FIGURE 10.



58. .151-inch diameter under head, $\frac{3}{8}$ inch long.
 59. .151-inch diameter under head, $\frac{1}{2}$ inch long.
 60. .151-inch diameter under head, $\frac{5}{8}$ inch long.
 61. .151-inch diameter under head, 1 inch long.

FIGURE 11.—Bags, canvas (rivets and burs); and rivets, belt, brass, bronze finish, with burs.

TABLE I.—Tool set (complete with tools), saddlers' (stock No. 41-T-3540)

Item No. (See figs. 1-11, incl.)	Stock No.	Components	Quantity
33	41-A-285	Anvil, saddlers', riveting, 1' x 2' x 4', with hole $\frac{1}{2}$ " diameter.....	1
5	41-A-1020	Awl, saddlers', pad, shouldered, size of blade 4".....	1
57	24-B-800	Bags, canvas (rivets and burs), depth 6", width 4" (each to contain one of the following items). Rivets, belt, brass, bronze finish, with burs: <div style="display: flex; justify-content: space-between;"> <div style="text-align: left;"> <i>Diameter under head</i> .151"..... .151"..... .151"..... .151"..... </div> <div style="text-align: left;"> <i>Length</i> $\frac{3}{8}$"..... $\frac{1}{2}$"..... $\frac{5}{8}$"..... 1"..... </div> <div style="text-align: left;"> <i>Commercial No.</i> 10..... 10..... 10..... 10..... </div> </div>	4
51	41-B-1053	Blades, awl, saddlers', pegging, length $1\frac{1}{2}$ "..... Blades, awl, saddlers', stitching: <div style="display: flex; justify-content: space-between;"> <div style="text-align: left;"> <i>Size No.</i> 52..... 53..... 54..... 55..... 56..... 57..... </div> <div style="text-align: left;"> <i>Length</i> $1\frac{3}{4}$"..... 2"..... $2\frac{1}{8}$"..... $2\frac{1}{4}$"..... $2\frac{1}{2}$"..... </div> </div>	2
12	41-B-1355	Blades, saddlers', draw-gage.....	1
15	41-C-420	Carriage (saddlers'), pricking, box handle, with three pricking wheels, size Nos. 7, 8, and 10.....	1
4	41-C-1875	Clamp, saddlers', stitching, with foot lever.....	1
17	41-C-2710	Creasers, saddlers', double, wood, ebony or lignum-vitae.....	1
32	41-D-1376	Divider, wing, type C, size 8".....	1
50	41-F-3027	Followers, saddlers', draw-gage, $\frac{5}{8}$ ".....	3
31	41-G-160	Gage, draw, saddlers', with trigger handle. 6" slide.....	1

TABLE I.—Tool set (complete with tools), saddlers' (stock No. 41-T-3540)—Con.

Item No. (See figs. 1-11, incl.)	Stock No.	Components	Quan- tity
13	41-H-56	Haft, awl, saddlers', pegging.....	1
14	41-H-65	Haft, awl, saddlers', stitching.....	1
25	41-H-626	Hammer, riveting, weight 12 oz.....	1
2	41-K-140	Kit, tool, canvas, M-1921 (empty).....	1
20	41-K-570	Knife, saddlers' round point, size of blade 5".....	1
7	41-K-585	Knife, saddlers', square point, size of blade (approximate), $\frac{5}{8}$ " x $3\frac{7}{8}$ ".....	1
3	41-M-200 ¹	Machine, saddlers', splitting, size 8".....	1
39	41-N-285	Needles, saddlers', in leather case.....	1
		Contents of case:	
40	41-N-170	2 pkgs. needles, harness, egg-eye, No. 3.....	
41	41-N-172	2 pkgs. needles, harness, egg-eye, No. 4.....	
42	41-N-174	1 pkg. needles, harness, egg-eye, No. 5.....	
43	41-N-176	1 pkg. needles, harness, egg-eye, No. 6.....	
45	41-N-240	1 each needles, packing (or baling), No. 10, length, 5".....	
46	41-N-242	1 each needles, packing (or baling), No. 11, length, $4\frac{1}{2}$ ".....	
47	41-N-244	1 each needles, packing (or baling), No. 12, length, 4".....	
48	41-N-246	1 each needles, packing (or baling), No. 13, length, $3\frac{1}{2}$ ".....	
49	41-N-248	1 each needles, packing (or baling), No. 14, length, 3".....	
44	41-N-440	1 pkg. needles, trimmers', "Glovers", No. 3.....	
27	41-N-573	Nippers, end-cutting, with adjusting screw in handle, length, 10".....	1
37	41-P-80	Palm, sewing.....	1
30	41-P-1759	Pliers, flat-nose, length (over-all) 6".....	1
19	41-P-2988	Punch, bag, saddlers', $\frac{3}{4}$ ".....	1
16	41-P-2990	Punch, bag, saddlers', 1".....	1
26	41-P-3000	Punch, belt, revolving, six tubes, Nos. 1 to 6.....	1
		Punches, cutting, type III, leather, canvas, etc., single-bow (belt or saddlers'):	
		<i>Diameter of cut</i>	
22	41-P-3403	$\frac{1}{8}$ "..... No. 2.....	1
23	41-P-3411	$\frac{1}{4}$ "..... No. 10.....	1
24	41-P-3414	$\frac{3}{8}$ "..... No. 13.....	1
		Rivets, belt, brass, bronze finish, with burs:	
		<i>Diameter</i> <i>under head</i> <i>Length</i> <i>Commercial No.</i>	
58	43-R-4159	.151"..... $\frac{3}{8}$ "..... 10.....	$\frac{1}{4}$ lb.
59	43-R-4160	.151"..... $\frac{1}{2}$ "..... 10.....	$\frac{1}{4}$ lb.
60	43-R-4161	.151"..... $\frac{3}{8}$ "..... 10.....	$\frac{1}{4}$ lb.
61	43-R-4164	.151"..... 1"..... 10.....	$\frac{1}{4}$ lb.
9	41-R-2800	Rule, carpenters', folding, type B, length 2 feet, 4 folds.....	1
21	41-S-1101	Screw driver, common, type III, normal-duty, class C, single-grip, length of blade 3".....	1
6	41-S-2250	Set, rivet, oval, No. 10.....	1
28	41-S-2854	Shears, trimmers, bent-handle, length (over-all) 10".....	1
34	41-S-3825	Slicker, saddlers', steel, thickness of blade $\frac{1}{4}$ ".....	1
29	41-S-5274	Stone, sharpening, type I, mounted, class A, medium grit, thickness 1", width 2", length 6".....	1
36	41-T-1765	Thimbles, steel, aluminum-lined, open-end, size $\frac{3}{4}$ ".....	2
35	27-T-2704	Thread, linen, type C, hand-shoe, brown (light), No. 10, 2-ounce ball..	2
10	41-T-3340	Tool, saddlers', claw, octagon-riveted, length (over-all) 6".....	1
		Tools, saddlers', round-edger:	
8	41-T-3351	Commercial No. 1.....	1
11	41-T-3352	Commercial No. 2.....	1
1A, 1B	41-T-3540	Tool, set, saddlers'.....	Set
38	34-W-49	Wax, saddlers', summer, brown.....	1 oz.
18	41-W-530	Wrenches, haft, awl, saddlers', pegging and stitching.....	2

¹ This item is furnished for garrison use only, in which case it is directed by the commanding officer.

TABLE II.—Articles taken from set and carried in canvas tool kit by saddler on march

Item No. (See figs. 1-11, incl.)	Stock No.	Components	Quantity
5	41-A-1020	Awl, saddlers', pad, shouldered, size of blade 4"-----	1
57	24-B-800	Bag, canvas (rivets and burs), depth 6", width 4"-----	1
51	41-B-1053	Blades, awl, saddlers', pegging, length 1½"-----	2
		Blades, awl, saddlers', stitching:	
		Size No. Length	
52	41-B-1060	53----- 1¾"-----	2
53	41-B-1061	54----- 2"-----	2
54	41-B-1062	55----- 2⅛"-----	3
55	41-B-1063	56----- 2¼"-----	3
56	41-B-1064	57----- 2½"-----	2
13	41-H-56	Haft, awl, saddlers', pegging-----	1
14	41-H-65	Haft, awl, saddlers', stitching-----	1
25	41-H-626	Hammer, riveting, weight 12 oz.-----	1
2	41-K-140	Kit, tool, canvas, M-1921 (empty)-----	1
20	41-K-570	Knife, saddlers', round point, size of blade 5"-----	1
		Needles, harness, egg-eye, pkgs.:	
40	41-N-170	No. 3-----	2
41	41-N-172	No. 4-----	2
42	41-N-174	No. 5-----	1
43	41-N-176	No. 6-----	1
26	41-P-3000	Punch, belt, revolving, six tubes, Nos. 1 to 6-----	1
		Rivets, belt, brass, bronze finish, with burs:	
		Diameter under head Length Commercial No.	
58	43-R-4159	.151"----- ⅝"----- 10	¼ lb.
59	43-R-4160	.151"----- ½"----- 10	¼ lb.
60	43-R-4161	.151"----- ⅜"----- 10	¼ lb.
6	41-S-2250	Set, rivet, oval, No. 10-----	1
35	27-T-2704	Thread, linen, type C, hand-shoe, brown (light), No. 10, 2-ounce ball-----	2
		Tools, saddlers', round-edger:	
8	41-T-3351	Commercial No. 1-----	1
11	41-T-3352	Commercial No. 2-----	1
38	34-W-49	Wax, saddlers', summer, brown-----	1 oz.

3. Allowance of material.—Amounts of materials used in repair of harness and horse equipment are published from time to time in Tables of Basic Allowances. For classification, processing, and inspection of leather and leather equipment, see TM 10-226.

4. Cutting leather.—*a.* In using a side or part of a side of leather, care should be taken to cut from the proper part of the side. The back is generally the best, while the belly and flanks are the least desirable, being looser grained.

b. Care should be taken to cut just the portion needed, even though an odd shape might be left by so doing. It may develop later that this odd shape can be used to advantage.

5. Working leather into shape.—In working leather into shape it will be necessary to soak it until it is soft and pliable. Russet leather does not require as much soaking as black leather. Leather should not be soaked long enough to cause the stuffing to come out.

6. Finishing edges.—The edges of articles made of black leather are finished by applying blacking to them with a brush or piece of cloth and burnishing with awl haft handle or hammer handle and finishing with a piece of cloth. Edges of articles made of russet leather are finished in the same manner, except that the edges are slightly dampened instead of being blackened.

7. Using saddlers' wax.—This wax works best when in a temperature of about 75° F. When cold it is brittle and will not adhere to the thread. If too warm it will be soft and sticky and unfit for use. Saddlers' wax is used to make the thread pliable and wearing. The wax seals itself into and around the thread, giving it a smooth surface. The thread can then be pulled through holes without tearing or sticking. Wax weatherproofs the thread and prolongs its life.

8. Making waxed end.—Waxed ends are made of Irish flax which is issued in balls. A ball is usually placed in some receptacle to hold it secure and the thread drawn from the inside of the ball. The thread is placed across the right thigh a few inches from the end; its ends taken in the left hand; the palm of the right hand placed upon the thigh over the thread; and the hand rubbed downward. This causes the thread to untwist. The thread is then grasped with the right hand at a point about 10 inches from the end, and with the left hand at the end. The hands are then separated, causing the thread to pull apart, leaving tapering ends. A convenient length of about 2 yards is then measured off and the thread broken at the desired point by repeating the operation on the thigh. One end of the thread which has been thus broken off is taken in the left hand, and the end of the thread which is attached to the ball placed beside and just short of it. It is then measured off and broken as before so as to come just short of the other end of the detached piece. This operation is repeated until a sufficient number of strands is obtained. This will usually be from three to six, depending upon the weight of thread and character of work. The strands as thus formed are then hung over a hook at their middle point; the ends are waxed for about 6 inches and each end twisted separately by placing it upon the thigh and rubbing it with the palm of the right hand. The thread is then waxed thoroughly by rubbing the wax over it several times. Four or five inches of each end is then threaded through a needle and turned back. The waxed end is then complete and ready for use in sewing.

9. Sewing with waxed end.—The leather to be sewed should be prepared and the positions of stitches marked by the pricking wheel. It is then placed in the clamp, a hole made with an awl through which

one needle is passed, and the waxed end pulled through to its middle point. Should the waxed end have been used previously, the two ends will be fastened together by a shoemakers' knot. In this case both needles are passed through the hole in opposite directions from the inside of two or more thicknesses so as to leave the knot inside. Another hole is punched with the awl; the needle in the left hand is passed through it from left to right and the other one passed through it from right to left, both threads being drawn through until taut, and the seam continued by repeating this operation. Upon reaching the end of the thread or the end of the seam, one or two back stitches are taken and both ends cut off. This manner of sewing prevents knots being left where they might rub the animal.

10. Using double needle.—For work around loops and other inaccessible places it will be found convenient to use an improvised needle consisting of a fine brass or copper wire, doubled and slightly twisted, with an eye left at the middle. This can be bent into almost any shape. The awl holes should be made large in such cases as this will save trouble.

11. Preventing sore fingers.—Each saddler will find a grained-leather finger stall a necessity. Constant sewing with waxed thread soon wears the skin from the fingers and makes them very sore. If a spot becomes tender it can be relieved by wrapping a single strand of waxed thread close together around the finger over the spot. This is better than courtplaster and will last much longer.

12. Repairing breaks.—*a. Single thickness.*—To repair breaks in a strap or trace of single thickness, the ends of the straps should be skived, lapped together for a sufficient distance to make the joint secure, and sewed parallel to the edges.

b. Double thickness.—The leather strips should be separated and about 3 inches cut off the inside layer of one end and the outside layer of the other end. All four ends are skived, lapped over, and sewed. A few stitches should be made lengthwise near the center to hold down the ends.

c. More than double thickness.—To repair breaks in straps of more than two thicknesses, the layers of leather should be cut back on the inside of one and the outside of the other, the end skived, lapped together, and sewed.

13. Repairing with rivets.—*a.* The parts to be riveted should be placed together, a hole punched, the rivet passed through, and the bur driven down into place with the rivet set. The rivet should then be cut off, leaving an end about $\frac{1}{8}$ inch long, which is upset with the rivet set.

b. Rivets should not be used except in an emergency as they make an unsightly job, and the hole punched for the rivet takes away a considerable part of the leather, thus weakening it.

14. Modifying McClellan saddles.—*a. General.*—(1) *Parts to be removed.*

Straps, quarter side.

Safes, quarter strap, with cincha tie straps.

Cinchas.

Halter squares from ends of quarter straps, both pommel and cantle.

(2) *Parts needed for one saddle.*

1 pair skirts.

1 girth.

1 piece of web, right, with leather billets attached.

1 piece of web, left, with leather billets attached.

4 screws, $\frac{7}{8}$ -inch, No. 6 wood, round head, brass, bronze finish.

4 nails, saddle, with $\frac{1}{2}$ -inch bronze heads.

4 filler pieces (leather).

2 pieces $\frac{1}{4}$ -inch woven felt cut to fit side bars according to size of saddle (to be ordered, 11, 11 $\frac{1}{2}$, or 12, according to size of saddle).

4 No. 8 burs, brass, bronze finish.

If felt linings are needed to replace the worn sheepskin with wool, the number of saddles of each size should be given.

b. Method.—(1) Remove halter squares from end of quarter straps, both pommel and cantle, by cutting stitching in laps, then cut off ends of straps even with the bottom edge of side bar.

(2) Rip stitching the full length of lower part of side bar and continue around each end for approximately 3 inches.

(3) Use a stitching awl for removing the stitches from the parts cut open.

(4) Turn saddle bottom side up, fold cover of side bar bottom toward center of saddle, and secure it there temporarily by placing three large tacks through leather of each side into tree.

(5) Take web with leather billets attached (right and left web can be determined by the diagonal cut), place same on bottom of side bar, and locate them, leather billets upward or toward the saddle seat, with the center billet directly over the stirrup strap loop, and with the diagonal edge of web flush with top edge of side bar.

(6) Secure web to tree by using numerous long, large-headed tacks.

(7) Take the filler pieces and place one on each side of web, having the beveled edge pointing away from web.

- (8) Secure with several small tacks.
- (9) Place skirt, grain side out, with the beveled edge on top of side bar, in such position that girth billets will be under skirt when saddle is in use.
- (10) Secure to the tree with enough tacks to keep same in place until stitching is completed.
- (11) Return side bar cover to its original position, thus having the skirt and web between the top and bottom cover of side bar.
- (12) Tack temporarily all three pieces together.
- (13) Sew with 3-cord No. 10, wax end, using care to stitch in the old holes.
- (14) After stitching is completed, secure the ends of straps, quarter, pommel and cantle, with a $\frac{7}{8}$ -inch No. 6 round wood screw, using a bur under the head.
- (15) Place a saddle nail at lower extreme ends of both cantle and pommel cover where these parts join side bar cover.
- (16) Should it be desired to cover under part of side bars with felt, place the proper size felt on bars, using a good grade of glue, and place several tacks through felt into tree temporarily, after stretching felt tight in all directions.
- (17) The same stitching that secures skirt and web will also secure felt to that part of saddle which has been cut open; the balance of sewing being done with one needle, with stitches approximately $\frac{1}{4}$ -inch long.
- (18) Great care should be taken to remove all tacks from felt after saddle is completed.

[A. G. 062.11 (12-13-41).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

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D 2 (3); B 2, 6 (2); IR 2, 5, 6 (5); IBn 2, 5, 6 (2); IC 2, 5,
6, 8, 10 (5).

(For explanation of symbols see FM 21-6.)

**GAYLAMOUNT
PAMPHLET BINDER**



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NON-FUNCTIONAL BOOK



